

Technical Assistance in Determining Options for Energy Efficiency in Existing Buildings

Energy Commission Staff Workshop

Architectural Energy Corporation

Tecmarket Works

Lutzenhiser and Associates

Davis Energy Group

RLW Analytics

Mort Blatt

SDV/ACCI

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Project Team

- **Architectural Energy Corporation – Prime contractor**
- **Davis Energy Group – Residential technology research**
- **Lutzenhiser Associates – Behavioral analysis**
- **Morton H. Blatt – Commercial technology research**
- **RLW Analytics – Market research**
- **SDV/ACCI – Market research**
- **Tecmarket Works – Market research and analysis**

Project Overview

- **Supported by PGC plus Energy Commission Energy Resources Program Account funding**
- **Advisory group**
 - Energy Commission, CPUC, PG&E, SCE, Sempra
- **Integrate market and regulatory approaches to improve adoption rates**
- **Address issues within and outside the scope of the Energy Commission and CPUC**
- **Approach problem from a market perspective**
 - Barriers
 - Market actors and actor networks
 - Behavior

Barriers Noted

● **Participant Barriers**

- Lack of awareness of problem (or opportunity)
- Skepticism about benefits

● **Product Barriers**

- First cost
- Performance uncertainty

● **Market and Market Operations Barriers**

- Lack of professional expertise in market
- Lack of usable and trusted information

● **Product Provider Barriers**

- Ease and speed of acquisition / availability
- Familiarity and expertise with product

● **Purchase Barrier**

- Need to see it and make it real; comfort with concept

Current Program Emphasis and Gaps

Emphasis

● **Residential Measures**

- CFLs (79% of GWh), refrigerators, programmable Tstats (38% of therms), pool pumps and central AC

● **Commercial Measures**

- Lighting (49% of GWh), HVAC upgrades and motors

● **Strategies**

- Retrofit, remodeling and new construction;
- End-users, local governments and organizations, builders/contractors,
- Rebates, information, design assistance, audits, direct installation

Gap

- Shell measures, tune-ups, duct sealing, evap cooling, water heating
- Refrigeration, office equipment, commissioning/retro-commissioning
- Repair, building sale and finance/refinance
- Manufacturers, real estate professionals, lenders
- Upstream market interventions, financing, demonstrations

Intervention Portfolio

● **Intervention objectives**

- Address market barriers
- Address program gaps
- Focus on key trigger events

● **Portfolio objectives**

- Synergy between interventions
- Balance between residential and commercial customer impacts
- Include hard to reach
- Balance between regulatory and voluntary approaches
- Build infrastructure capacity

Market vs. Regulatory Approaches

- **Most respondents favored market approaches (at least initially) to build confidence and capacity in market**
- **Start small and build support with local governments or organizations**
- **Conduct pilot programs in supportive jurisdictions**
- **Regulatory actions (where desirable) should be phased in to allow time to build market capacity to respond**

Residential Interventions

Intervention

- Information to All Homeowners
- Residential Time-of-Sale Energy Ratings
- Residential Equipment Tune-ups and O&M
- Whole Building Diagnostic Testing
- Low Income Multifamily Housing

Primary Role

Information portal

Trigger event

Program gap

Program gap

Equity

Commercial Interventions

Intervention

- Commercial Building Benchmarking
- Retro-commissioning
- Energy Efficient Commercial Leasing

Primary Role

Information portal

Program gap

Trigger event

Upstream Interventions

Intervention

- Manufacturer Partnerships
- Energy Efficient Procurement
- Branding

Primary Role

Program gap

Build infrastructure

Program support

Information and Training Initiatives

Intervention

- Information, Case Studies and Demonstrations
- Technical Training and Certification

Primary Role

Market barrier

Build infrastructure

Overarching Policy Initiatives

Intervention

- Demand Response
- Energy Efficiency Choice Risk Protection
- Interagency / Cross Program Coordination

Primary Role

Market barrier

Market barrier

Program support

Information to All Homeowners

- **Intervention type: Voluntary**

- **Trigger event: No specific trigger event – information portal**

- **Description**

- Use utility website as interface
- Provide energy consumption feedback
- Provide multi-level energy audits
- Target buildings with greatest efficiency potential or customer interest for additional services such as on-site surveys, direct installation, program referrals
- Provide links to existing programs and financing

- **Recommendations**

- Expand use of utility website as information portal
- Provide information to program implementers
- Develop financing options

Residential TOS Energy Ratings

- **Intervention Type: Mandatory**

- **Trigger Event: Time-of-sale**

- **Description**

- Energy rating done prior to listing
- List of cost effective improvements suitable for energy improvement mortgage (EIM) application
- Disclosed to homebuyers, appraisers
- Rating information available for marketing purposes
- Program, EIM, HUD title 1 loan opportunities disclosed

- **Recommendations**

- HERS proceeding
- EIM portfolio standard
- Continuing ed requirement for realtors, lenders and appraisers
- Incentives to buy down ratings, interest rate breaks, lender incentives

Residential Equipment Tune-ups and O&M Services

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- **Intervention Type: Mandatory**

- **Trigger Event: Equipment replacement, TOS, maintenance**

- **Description**

- Technician training through community colleges and Voc/tech schools
- Certification through North American Technical Excellence (NATE)
- Educate consumers
- Provide incentives initially
- Advertising support for quality installations and maintenance practices

- **Recommendations**

- Move toward mandatory diagnostic based equipment tune-ups and installation at TOS and replacement
- Reimbursable equipment wholesale surcharge

Whole Building Diagnostic Testing

- **Intervention Type: Voluntary**
- **Trigger Event: Remodel, equipment replacement, building problem**
- **Description**
 - House as system approach
 - Diagnostic evaluation and testing to identify flaws
 - Evaluate health and comfort issues; valued by consumers
 - Implement fixes
 - Verify performance
 - Contractor provides all services in one-stop shopping approach
- **Recommendations**
 - Engage insurance industry
 - Modify cost-effectiveness methodology to account for non-energy benefits
 - Value self-verification

Low Income Multifamily

- **Intervention Type: Mandatory with voluntary components**
- **Trigger Event: TOS, refinance, lease or rehabilitation**
- **Description:**
 - Benchmarking and tracking
 - Use state agencies as info hub
 - Revise utility allowances
 - Focus on rehabilitation and preservation projects
- **Recommendations:**
 - Work with HUD to write separate utility allowance guidelines for energy efficiency projects
 - Require energy ratings and apply minimum efficiency standards to projects receiving state funding
 - Allow rating as a qualified expense
 - Simplify rating application process
 - Provide financing and incentives

Benchmarking

- **Intervention Type: Voluntary with mandatory components**
- **Trigger event: Information portal; used also in TOS or refinance**
- **Description**
 - Benchmarking and tracking on utility website
 - Multi-level analysis based on availability of building characteristics data
 - Portal to program information
 - Target customers for additional services and referrals to retro-commissioning and audit programs
 - Require benchmarking at time-of-sale or refinance; as directed by lease
 - Disclose benchmarking info to appraiser and lender
- **Recommendations**
 - Co-brand with Energy Star
 - Requirements to state agencies on implementing the system
 - Address data access and ownership issues

Retro-commissioning

- **Intervention Type: Voluntary**
- **Trigger events: Referral, TOS, lease, remodel, budget cycle**
- **Description:**
 - Retro-commissioning existing buildings
 - Benchmarking questions as screening tool
 - Ongoing relationship
 - Phased projects
 - Move to audits and incentives or direct installation
 - Incentives likely needed initially
- **Recommendations:**
 - Retro-commissioning of state buildings
 - Provide case studies relevant to businesses
 - Engage risk mitigation/risk management functions
 - Build infrastructure capability

EE Procurement and Procurement Support

- **Intervention Type: Voluntary**

- **Trigger Event: Bulk purchase**

- **Description**

- Acquisition standards and specifications
- Includes other government and non-profit organizations
- Develop centralized product assessment function
- Develop sales force
- Develop communications networks

- **Recommendations**

- Executive order for offices under governor
- Legislation with funding to establish systems and assessment function
- Coordinate with existing Environmentally Preferable Purchasing Team
- Move from energy office to purchasing office

Energy Efficient Commercial Leasing

- **Intervention Type: Voluntary**
- **Trigger event: TOL or renewal trigger event**
- **Description**
 - Develop practices from model leases
 - Focus on tenant improvement events
 - Catch before lease expires
 - Market to real estate agents
 - Work with leasing agents to identify space
- **Recommendations**
 - Discuss with USGBC and Energy Star
 - Educate real estate agents, property managers, appraisers
 - Benchmarking clause
 - Property tax exemption or transfer payments

Upstream Interventions/Manufacturer Partnerships ²²

- **Intervention Type: Voluntary**

- **Trigger Event: No specific trigger event**

- **Description**

- Addresses risk and cost barriers
- R&D for product development
- Rebates and other incentives to reduce costs – more economical than end-user rebates due to multiplier effect.
- Purchasing and procurement to prime market
- Link to Information, Case Studies and Demonstration initiative

- **Recommendations**

- Prioritize opportunities and develop partnerships
- Policy to direct funding toward upstream programs

Branding

- **Intervention type: Voluntary**

- **Trigger event: No specific trigger event**

- **Description**

- Move beyond Energy Star efficiency levels and product coverage
- Use CEE tier approach
- Limit incentives to higher tier products
- Establish co-brand
- Use co-brand in product lines not covered by Energy Star

- **Recommendations**

- Policy on branding approach, no legislation needed
- Pressure Energy Star to ramp up efficiency levels and equipment coverage
- Work with other states facing same issue
- Use Energy Star as a minimum level for purchasing programs

EE Technical Training and Certification

- **Intervention Type: Voluntary, with potential mandatory certification**
- **Trigger Event: No specific trigger event**
- **Description**
 - Improve service quality
 - Establish consumer confidence
 - Build market capacity
 - Develop central oversight organization
 - Provide training grants for Voc/tech schools and community colleges
 - Focus on service providers (contractors, commissioning agents, etc.)
 - Continuing ed requirements for professional property managers, building operators, real estate, lending and appraisal professionals
- **Recommendations**
 - Certify service providers
 - Use existing certification organizations (such as NATE)
 - Add energy content to continuing education requirements

EE Choice Risk Protection

- **Intervention Type: Voluntary**

- **Trigger Event: Program participation**

- **Description:**

- Optional component added to incentive programs
- Addresses risk avoidance, skepticism, institutional procedures, reliability uncertainty and performance uncertainty; more potent than price barrier

- **Recommendations**

- Form risk assessment function
- ID programs that need risk mitigation
- Allocate financial responsibility between program participants, manufacturers, distributors etc.
- Design pilot program
- Share costs with other states

Information, Case Studies and Demonstrations

- **Intervention Type: Voluntary**

- **Trigger Event: No specific trigger event; support for all initiatives**

- **Description:**

- Addresses many of the market barriers identified – lack of awareness of problem, skepticism of benefits, lack of trusted info, performance uncertainty, comfort with product or concept
- Info products: fact sheets, brochures, product directories, design guidelines, journal articles,
- Training materials: manuals, presentations, videos.
- Demonstrations: tours, meetings, word of mouth
- Extend influence of existing training centers

- **Recommendations**

- Needs funding source; infrastructure exists
- Develop overall info dissemination plan
- Value information and education programs under PGC structure

Demand Response

- **Intervention Type: Voluntary and Mandatory components**
- **Trigger Event: System stress, rate change, service connection trigger events**
- **Description**
 - Support existing Energy Commission and CPUC programs
 - Use time-of-use for small and medium customers; real-time-pricing for large customers
 - Promote new products and R&D needed to implement automated demand response through PIER and Appliance Standards
 - Promote programs that provide automated demand response capability
 - Educate customers about time-of-use, real-time-pricing and energy cost savings potential
 - Provide phase in period with shadow bills
- **Recommendations**
 - Implement mandatory demand response rates
 - Integrate demand response and energy efficiency program delivery
 - Provide hedging options for comfort sensitive customers
 - Eliminate programmatic disincentives for thermal energy storage systems

Interagency / Cross Program Coordination

- **Intervention Type: Voluntary**
- **Trigger Event: No specific trigger event; policy planning process calendars**
- **Description:**
 - Improve coordination between multiple program providers
 - Address implementation, referrals and evaluation
 - Provide central referral system
 - Include PGC, procurement and Energy Commission programs
- **Recommendations:**
 - Make coordination part of program implementation requirements
 - Include implementation and evaluation in coordination plan
 - Develop policy on how to share savings between programs offering and receiving referrals

Thank You for Your Comments

Additional written comments accepted through May 6, 2005

Send comments to Dale Trenchel at the Energy Commission

dtrenchel@energy.state.ca.us